Technical Specification Group Services and System Aspects
Meeting #13, Beijing, China, 24-27 September 2001

TSGS#13(01)0456

Source: **TSG-SA WG4**

Title: CR to TS 26.231 on Request to change muting of transmitter from 5th info bit to 4th info bit at beginning of a TTY burst (Release 5)

Document for: **Approval**

Agenda Item: **7.4.3**

The following CR, agreed at the TSG-SA WG4 meeting #18, is presented to TSG SA #13 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.231	001		REL-5	Request to change muting of transmitter from 5th info bit to 4th info bit at beginning of a TTY burst	F	5.0.0	S4	TSG-SA WG4#18	S4-010488R

3GPP TSG-SA4 Meeting #18 ***Tdoc S4-010488R***
Erlangen, Germany, September 3-7, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **26.231** **CR** **001** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Request to change muting of transmitter from 5th info bit to 4th info bit at beginning of a TTY burst.
Source:	⌘	TSG SA WG4
Work item code:	⌘	GTT ***Date:*** ⌘ Sept. 24th, 2001
Category:	⌘	**F** ***Release:*** ⌘ Rel 5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ Currently, according to the test specification, at the beginning of a new TTY burst muting of the output of the transmitter occurs after the 5th info bit and should not occur prior to that. The reason for muting is to avoid repeated or extra characters at the destination. If the stop bits are not muted, then a full TTY character is passed on to the speech encoder. At the receiver, the output of the speech decoder (TTY) is passed untouched by the CTM receiver because it is not CTM. It is ordinary landline TTY with some distortion introduced by the speech encoding/decoding process. There is a high probability that at the output this leaked TTY character will be recognized. Later, the same character will be transmitted and received as CTM, hence resulting in a repeated character (or just as bad an extra character depending on the distortion of the speech codec). The idea of muting the stop bits is that the partial TTY character (start bit and 5 info bits) will not be recognized at the destination, and hence only the CTM encoded/decoded character will be received. The consequence of this is that only the start bit and all 5 info bits (but not the stop bits) will leak through to the speech codec.
However, tests with real equipment have shown that there might be a risk that the TTY device at the destination will decode this character in spite of the muted stop bits. Possible reasons for this behaviour are e.g. the error concealment in case of weak radio channels or echos on the PSTN line. This results in repeated or extra characters occasionally being displayed on the TTY machine at the receive side.

Summary of change: ⌘ It is proposed that muting of the output of the transmitter be allowed after the 4th info bit. This would solve the problem that the destination-side TTY terminal might unwantedly decode the original Baudot Code signal. There doesn't appear to be any risk of false detection since with TDMA TTY, the output of the transmitter is muted after only the 2nd info bit (TIA does not have this requirement). They have tested extensively with hours of music, etc. and have never seen any problem.

Consequences if not approved:	⌘	Occasionally extra characters will be displayed on some TTY machines at the beginning of a typing burst. This could be very significant in some situations, for example if during an emergency call a repeated character were added to a numerical address.

Clauses affected:	⌘	Section 7.3 of TR 26.231 V5.0.0 (2001-03) (3GPP CTM Minimum Performance Requirements Rel 5). The affected section is attached below and highlighted with bold lettering. The attachment ctm_testing.zip includes the new test vector test1.pcm. The second attachment ctm_score.zip is identical to the attachment in TR 26.231 V5.0.0.		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7.3 Test of the Text Telephone Demodulator's Robustness Against False Detections

In this test case, the Baudot Code text telephone demodulator used in the test setup is tested against false detection of characters. In addition to this test, also the applicable parts of [3] shall be used for testing the Baudot Code demodulator's performance. If the purpose of the test is only to verify a CTM implementation, this subclause can be ignored.

For this test, the test script `test_false_detections` is provided. It consists of the following sub-tests:

1. **Test of the response of the adaptation module for a signal that has one valid start bit (1800 Hz) and ~~four~~three valid information bits (1400 Hz). The duration of the ~~fifth~~fourth bit is too short so that this sequence must not trigger the Baudot demodulator of the adaptation module. Therefore, the original audio signal must be passed to the output without muting.**